

DESCRIPTION OF A NEW SPECIES AND A KEY TO INDIAN SPECIES OF BELOSTOMATIDAE¹P. VENKATESAN AND T. K. RAGHUNATHA RAO²

(With seven text-figures)

Lauck and Menke (1961) showed that *Sphaerodema* was synonymous with Genus *Diplonychus* Laporte of sub-family Belostomatinae. Earlier workers in India, while recording and studying the biology of the species of this genus, had included them under *Sphaerodema* Laporte, overlooking *Diplonychus* (Presswala & George 1936, Rao 1962, Indira 1963, Madhavan 1973). Distant (1906) differentiated *S. annulatum* (Fabricius) from the other two recorded Indian species of this genus on the basis of the nature and the size of the hemelytra and the measurement of the head width between the eyes. He differentiated *S. molestum* Dufour from *S. rusticum* Fabricius on the basis of the size of the claw in the front tarsus. Menke (1960 & 1961) stressed the importance of the structure and terminology of male genitalia and gave a more critical analysis of other characters used to distinguish the taxa of this sub-family. Hence, it is felt worthwhile to include the characters of the genitalia in the present investigation while describing a new species of the genus *Diplonychus*, collected from Chetpet pond, Madras, India and forming a key to the Indian species of *Diplonychus*.

KEY TO THE INDIAN SPECIES OF
Diplonychus Laporte

1. Total body length less than 20 mm; body narrow and tapering; greatest expanse of hemelytra together shorter than the total body length. . . 2

Total body length more than 20 mm; body very broad; greatest expanse of hemelytra together equal to the total body length.

- .. *D. annulatum* (Fabricius)
2. Anterior claws shorter than the width of tarsus. . . 3
Anterior claws longer than the width of tarsus. . . *D. molestum* (Dufour)
3. Head length shorter than the width between the eyes; the posterolateral margin of the respiratory strap of male without the setal tufts or spikes; air straps meeting at the tip of aedeagus. . . *D. rusticus* (Fabricius)
Head length more than the width between the eyes; the posterolateral margin of the respiratory strap of male with a cluster of setal tufts or spikes; air straps not meeting at the tip of aedeagus. . . *D. indicus* sp. nov.

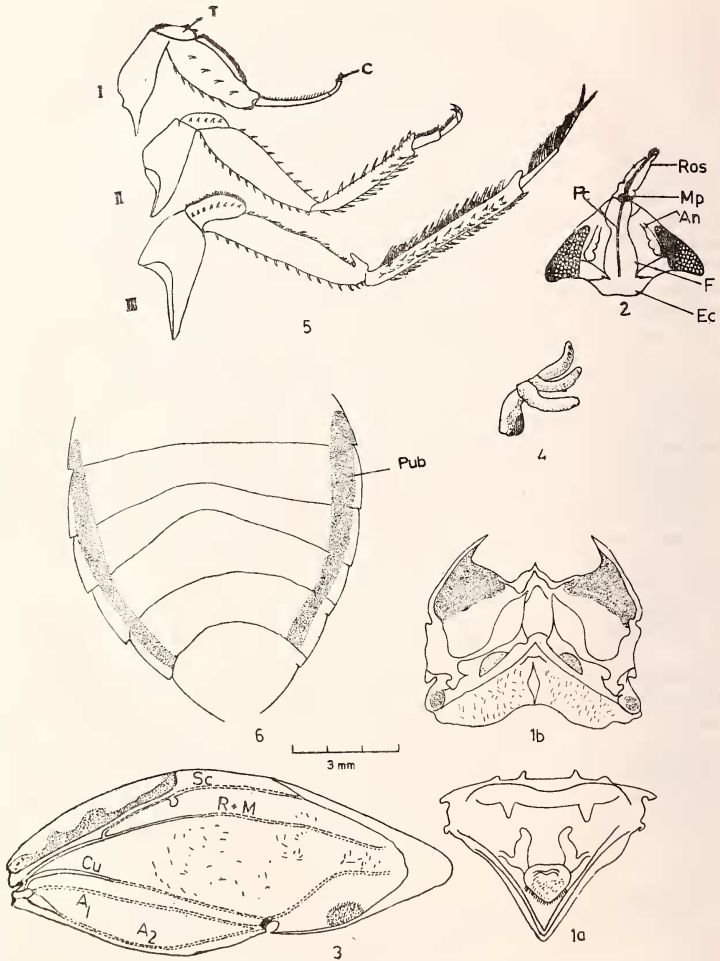
***Diplonychus indicus* sp. nov.**

(Figs. 1 to 7)

Diagnosis:

Small and elongated bug measuring 13.5 mm to 16.5 mm long, greatest width being 9.6 to 10.1 mm; ochraceous or ochraceous brown in colour; the lateral and basal margins of pronotum and embolium always paler than the meso—and metathoracic segments (Fig. 1); legs and ventral part of body concolorous; head $1\frac{1}{2}$ times longer than the width between the eyes; anteoculus moderately developed, shorter than the interoculus; eyes slightly convex; interoculus half as wide as the eye; eyes obliquely triangular, strongly flattened

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Figs. 1-6. *Diplonychus indicus* sp. nov.
 1a. Scutellum; 1b. Thoracic region; 2. Head; 3. Hemelytra; 4. Antenna; 5. I, II, III legs; 6. Ventral view of abdominal segments to show the ventrolateral pubescence.

Abbreviations:

(A₁, A₂)—Anals, An—Antenna, C—Claw, Cu—Cubital, Ec—Epiclypeus, F—Fron, Mp—Maxillary Palp, Pc—Postclypeus, Pub—Pubescence, Ros—Rostrum, R + M—Radial + Medial, Sc—Subcosta, T—Trochanter.

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dorsally and $1\frac{1}{2}$ times longer than wide (Fig. 2); external margin of eye often straight and continuous with the pronotum; bulgings present on the margin of anteoculus; posterolateral angle of anteoculus variable; claws and embolium of hemelytra paler than meso- and metathoracic segments but not smooth (Fig. 3) and punctured with setigerous holes; membrane of the hemelytra with a patch of minute chitinous hairs at the bottom; rostrum long and conical; segment I of rostrum 2 times longer than segment II (Fig. 2); antenna hidden, four segmented and located near the eyes with segments II and III bearing long curved finger-like projection dorsally; IV segment with slightly bulbous projection than that of II and III (Fig. 4); pronotum with lateral

margin nearly straight; anterior margin of pronotum more than half time as wide as the posterior margin.

Ventral laterotergites of abdominal segments III to VII with a narrow, sinuate, central band of pubescence, attaining the external margin at posterolateral angles at the region of III segment only (Fig. 6); abdominal sternites shiny with short spinules.

Legs shiny but often covered with minute spinules; front femur strongly dilated, bearing two grooves for the reception of tibia; front tibia and tarsus usually bearing rows of large setigerous punctures; front tarsus two-segmented, terminated by two small and equal claws that are shorter than the width of the tarsal segment; segments II and III of the tarsus



Fig. 7a. Genitalia of male *D. indicus* sp. nov.

Fig. 7b. Genitalia of female *D. indicus* sp. nov.

being fused; segment I of the tarsus shorter than segment II, the division being visible on the ventral side; two spinules project between the claws of the mesothoracic and metathoracic legs (Fig. 5).

The phallus composed of the IX abdominal segment, articulating within the genital capsule as on a U shaped sclerotic basal plate; arising from sides of the genital capsule at the articulations of the basal plate are the parameres, triangular in shape with a feather of setose hairs; a ligamentous lamina ventralis being attached at the base of the basal plate which articulated posteriorly with a rather bulbous sclerotized caudal extension—the ventral diverticulum; the basal half of the phallus surrounded dorsally and internally by rather heavily sclerotized plate—phallobase; a hollow sclerotized tubular aedeagus arises within the phallobase, which extends dorsal to the ventral diverticulum; the VIII abdominal segment being closely associated with the genital capsule, possesses the long air or respiratory straps; air straps not bifurcate and their arms not meeting at the tip of the aedeagus (Fig. 7).

In the male, the lateral margins of the air straps bearing a cluster of setae or setal tufts to form together as a spike extending downwards and being visible to the naked eye; besides the inner margin bearing another cluster of the same nature distolaterally but half as long as the cluster in the outer margin; arising in the phallobase a hollow sclerotized tubular aedeagus, which extends dorsally to the ventral diverticulum (Fig. 7a).

In the female, the air straps not possessing any long setae; female genital plate bearing one tuft of setae on the lateral margins apically (Fig. 7b).

Material studied:

Holotype ♂ collected from Chetpet pond, Madras, India on 6-2-1977.

Allotype ♀ and paratype 5 nymphs collected from the same locality.

The type series is deposited in the Museum of Loyola College, Madras, India.

Measurements:

Holotype and Allotype in mm. (Allotype measurements given in parenthesis). Total body length—14.65 (16.46); greatest width—9.6 to 10.1; anteoculus—1.78 (1.78); interoculus—2.12 (2.12); rostrum—2.78 (2.68); hemelytra—11.42 (11.52); anterior margin of pronotum—4.9 (5.2); posterior margin of pronotum—6.92 (6.92); head length—2.54 (2.30); thorax length—6.24 (6.19); abdominal length—7.87 (7.97); I leg—femur 2.88 (2.88); tibia 2.02 (1.92); tarsus 0.48 (0.48); claw 0.095 (0.095); II leg—femur 5.8 (4.8); tibia 5.56 (5.13); tarsus 2.73 (2.63); claw 0.58 (0.46); III leg—femur 4.08 (3.74); tibia 3.64 (3.46); tarsus 1.54 (1.78); claw 0.48 (0.38).

Remarks:

Diplonychus indicus sp. nov. is closely related to *D. rusticus* (Fabr.) in having hemelytra shorter than the total body length, anterior claws short and the presence of tuft of setae on the lateral sides of the basal plate in the female genitalia. It differs from *D. rusticus* in head length being more than the width between the eyes, cluster of setae forming the spike being present on the posterolateral margins of the respiratory straps, air straps not meeting at the tip of aedeagus, the pubescence of ventrolateral tergites from III to VII reaching the external margin on the segment III only and the membrane of the hemelytra with a patch of spinules at the bottom.

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NEW DESCRIPTIONS

REFERENCES

- DISTANT, W. L. (1906): The Fauna of British India, Rhynchota, Vol. III (Heteroptera—Homoptera). Taylor and Francis, London, 35-37.
- INDIRA, T. (1963): Biochemical and Cytochemical studies during development and ovarian growth in *Sphaerodema molestum* Duf. Ph.D. Thesis, Annamalai University.
- LAUCK, D. R. & MENKE, A. S. (1961): The higher classification of the Belostomatidae (Hemiptera). *Ann. Ento. Soc. Amer.*, 56: 644-657.
- MADHAVAN, M. M. (1973): Structure and function of the hypopyle of the egg of the bug *Sphaerodema molestum*. *J. Ins. Physiol.*, 20: 1341-1349.
- MENKE, A. S. (1960): A review of the genus *Lethocercus* (Hemiptera: Belostomatidae) in the Eastern Hemisphere with the description of a new species from Australia. *Aus. J. Zool.*, 8: 285-288.
- (1961): A taxonomic study of the genus *Abedus* Stal (Hemiptera: Belostomatidae). *Univ. California Publ. Ento.*, 16 (8): 393-440.
- PRESSWALA, M. J. & GEORGE, C. J. (1936): Morphology of *Sphaerodema rusticum* Fabr. *J. Univ. Bombay*, 4: 29-65.
- RAO, T. K. R. (1962): On the biology of *Ranatra clongata* Fabr. (Heteroptera: Nepidae) and *Sphaerodema annulatum* Fabr. (Heteroptera: Belostomatidae). *Proc. Roy. Ento. soc. Lond.*, 37: 61-64.

ACONOGONON KUTTIENSE (POLYGONACEAE)—A NEW SPECIES
FROM N. W. HIMALAYA¹

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(With five text-figures)

Aconogonon kuttiense sp. nov. (Figs. 1-5)

Arcte affinis *A. tortuosum* (D. Don) Hara, sed foliis anguste elliptico-lanceolatis subtus tomento denso albo-lanato indutis, inflorescentia plus minusve laxe racemosa axillaris brevis, perianthio majore differt; a *A. sericeum* (Pallas) Hara, inflorescentia racemosa, perianthio glabro, foliis minoribus discrepat.

Suffrutex erectus, nanus 15-45 cm altus; radix perennis, crassa. *Caulis* repetite dichotome ramosus, subteretis vel teretis, costatus, rubro-brunneus, indumento fere longe erectopatento vel adpresse brevi-setoso vestitus. *Folia* subsessilis, 1—3.5 × 0.3—1 cm, anguste elliptico-lanceolata vel oblonga, ad basim angustata et acuta, margine fortiter revoluta, ad

apicem obtuso-acuta, fere rubro-brunnea, supra tenuiter adpresse pilosa, infra dense albo-lanata, supra nervis depressis, infra nervis principalibus conspicuis. *Ochreae* tubulares, basin versus irregulariter laceratae, dein deciduae, membranaceae, distincte nervosae dense adpresse longe setosae, setis ± 1.5 cm longis vestitae. *Flores* racemosi, raro brevipaniculati, 1.5—3 cm longi, terminales vel axillares, albotomentosi; pedunculi 3—8 (—10) mm longi; Bractee membranaceae, primo tubulares dein irregulariter laceratae, adpresse longe albo-tomentosae 2.5—3 mm longae; pedicelli tenues, anguste marginati, glabri, 1—1.5 mm longi. *Perianthium* rubrum, campanulatum, 3.5—4 mm longum, ad trientem fissum undique glabrum, segmentis 5, raro 6, oblongis, obtusis ± 3 mm longis. *Stamina* 8; filamentis linearibus, 1—1.2 mm longis; antherae minutae, late oblongae, 0.3—0.4 mm longae. *Ovarium* par-

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